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Vegetation Survey of Campbell Tract Anchorage, Alaska

Scott Guyer

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Author

Scott Guyer is a biologist for the U.S. Department of the Interior, Bureau of Land Management.

Cover Photo

Cover photo shows Balsam poplar/willow scrub (foreground) vegetation type at Campbell Tract. Photo taken by Scott Guyer

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Scott Guyer

Fieldwork by:
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This survey could not have been completed with out the help and assistance of many individuals. The staff in the Mapping Section at the Alaska State Office provided aerial photography, orthophotography, and compiled and digitized vegetation classes. Special recognition and thanks to all those that assisted in the field data collection effort. They are Greg Balen, Rhonda Reynolds, Emily Davenport and Lori Guyer. Special recognition and thanks to Rhonda Reynolds, Charles Luddington and Bill Johnston for GIS assistance and to Lori Guyer and Greg Balen for providing editorial and publication assistance.

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Abstract

In 1965, construction began on the Bureau of Land Management's administrative offices and fire control center at Campbell Tract. Later, the Army determined that the 5,000-acre maneuver site was no longer necessary and in 1971 turned over administration of the area to the Bureau. In 1980, through the direction of the Congress of the United States, 4,325 of these acres were transferred to the State of Alaska, which later would become the Municipality of Anchorage's Far North Bicentennial Park (BLM retained 730 acres). Today Bureau and parklands are managed in harmony for non-motorized public recreation.

Vegetation inventories were conducted on the Campbell Tract in 1997, 1998 and 1999. The purpose of the surveys was to provide the BLM's Anchorage Field Office with baseline information about the types of vegetation present and to describe its distribution around Campbell Tract. This data will be useful for designing future management plans and to evaluate impacts from recreational activities. Aerial photographs at a scale of 1:6,000 were examined and vegetation cover type boundaries were determined. Vegetation sample sites were selected and visited. Each species was recorded and its percentage cover per height class was estimated. After the fieldwork was completed vegetation classes were determined based on vegetative structure and composition.

Data from all field seasons contributed to the final classification. The final classification resulted in thirteen vegetation classes. The results showed that paper birch classes comprised 537.2 acres (82.4%) out of the 652 acres surveyed on Campbell Tract. The results of all vegetation classes are: 31.5% (206 acres) white spruce/paper birch forest, 23.5 % (153 acres) paper birch open forest, 12.8% (83 acres) paper birch closed forest, 12.6% (82 acres) spruce/moss forest, 8.6% (56 acres) paper birch/white spruce open forest, 6.0% (39 acres) paper birch woodland, 1.5% (10 acres) balsam poplar closed forest, 1.3% (8 acres) disturbed, 1.0% (6 acres) low shrub birch mixed scrub, 0.7% (5 acres) white spruce woodland, and 0.6% (4 acres) balsam poplar/willow scrub.

Vegetation Survey of Campbell Tract Anchorage, Alaska

Introduction

The Campbell Tract (CT) is located within the city limits of Anchorage, Alaska (Figure 1). The facility is comprised of 730 acres of relatively undeveloped forested land, administered by the United States Department of the Interior (USDI), Bureau of Land Management (BLM). The site includes Campbell Airstrip, Campbell Creek Science Center and the administrative offices of the Bureau of Land Management's Anchorage Field Office.

The Campbell Airstrip, constructed by the United States Army, was completed in 1942. The Anchorage Field Office and warehouse complex was completed in 1968. The BLM worked with the Anchorage School District and the Municipality of Anchorage's Municipal Parks and Recreation Department to develop the Campbell Creek Science Center as an outdoor recreation and educational center. Construction of the Science Center was completed in 1996.

Campbell Tract is surrounded on the northeast, east and south sides by the Municipality of Anchorage's Far North Bicentennial Park (FNBP) and bordered on the northwest by Heritage Land Bank.

The Bicentennial Park, Campbell Tract, and Heritage Land Bank offer an array of recreational opportunities to Anchorage residents. Dog mushing, cross country skiing, hiking, mountain biking, and horseback riding trails cover much of the 4,990 acres that make up Campbell Tract and FNBP (Figure 2).

Survey Purpose

The primary purpose of the survey is to describe the vegetation of the Campbell Tract. The result of the vegetation survey will be vegetation class descriptions and a detailed map depicting vegetation classifications within the boundaries of the Campbell Tract.

An understanding of the vegetation composition of the Campbell Tract is important to adequately manage the area for its many uses. This information is especially useful when mitigating conflicts due to the increased pressure from recreation. It can also be used to asses wildfire potential and burn rates, to assess wildlife habitat within the Campbell Tract boundaries, and to develop a base geographic information system (GIS) layer.

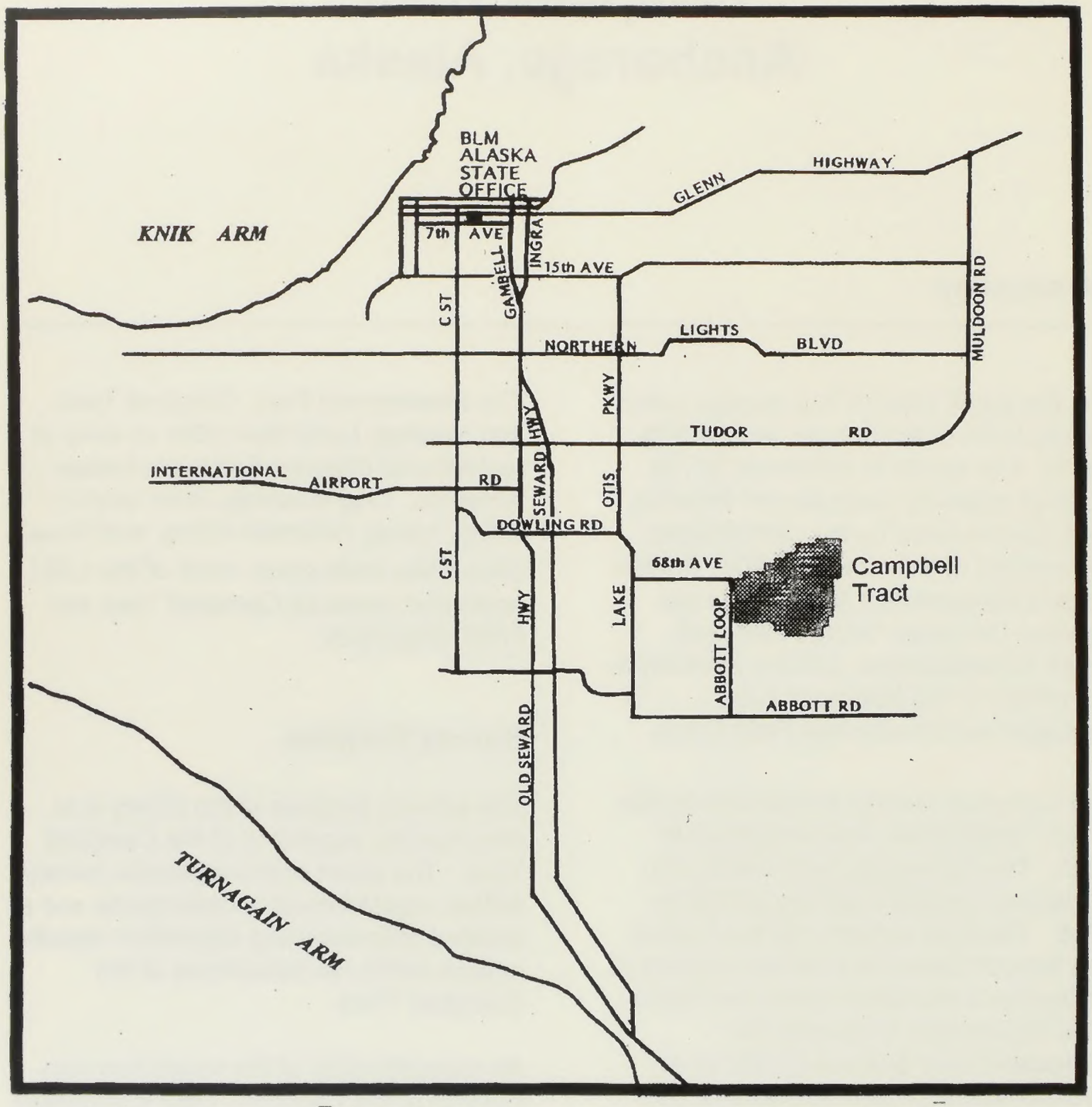

Figure 1. Campbell Tract location in Anchorage, Alaska

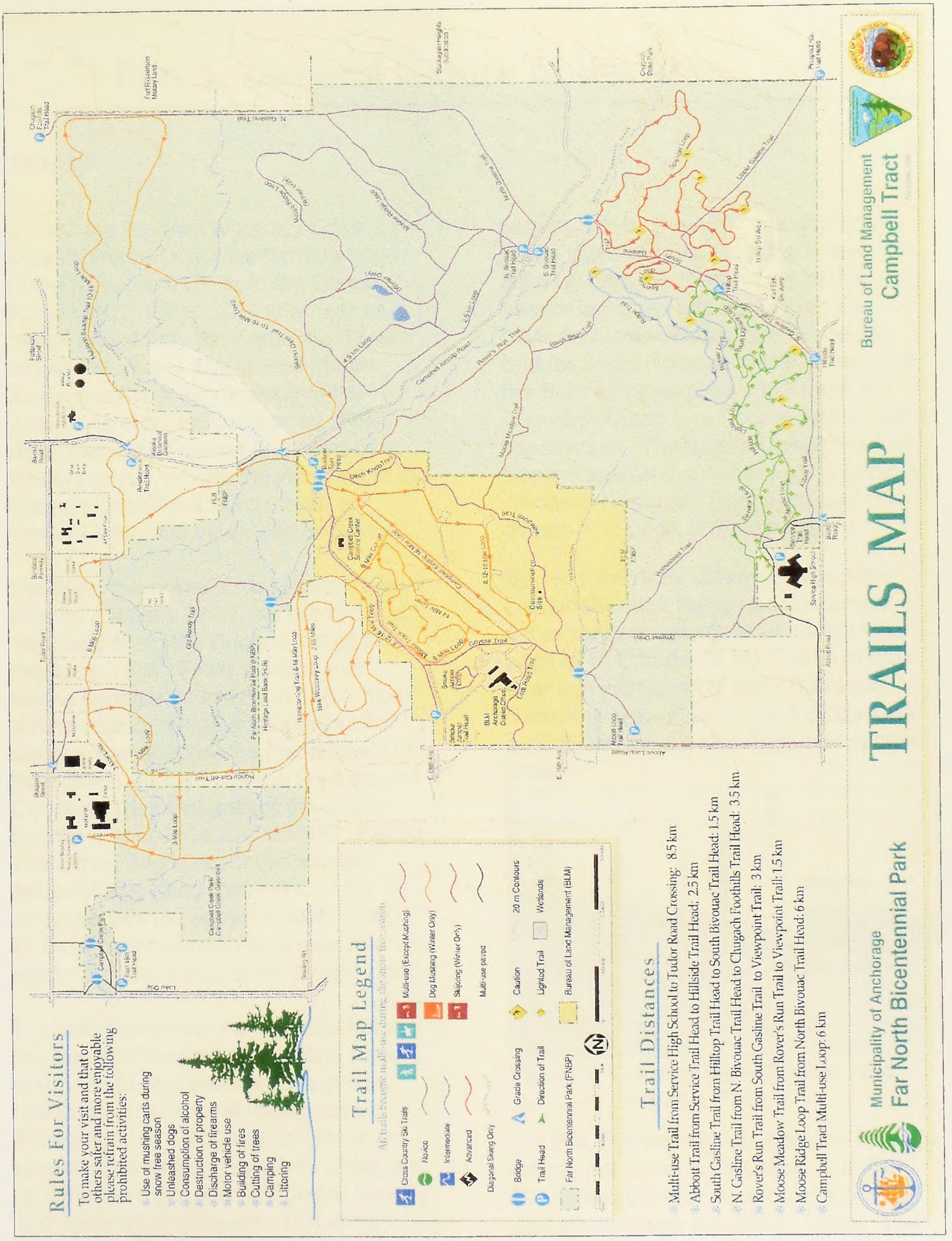

Figure 2. Campbell Tract, Heritage Land Bank and Far North Bicentennial Park Trail Map and land status.

Part 1. General Nature of the Area

History

In 1867 the Russian emissary Edward de Stoeckl offered to sell the territory known as the Russian America to the United States (*USDI 1999*). The offer was accepted and shortly thereafter the Senate ratified the treaty. The United States Government took possession of the "Alaska" territory on October 18, 1867. Other than lands owned and used by Alaska natives, private individuals and the Russian Orthodox Church, most of Alaska's vast land mass was unclaimed.

The State Department, which was responsible for Alaska's lands, transferred that responsibility to the Department of the Interior in 1873. From the time that Alaska became a territory in 1867, most of rural Alaska remained under public domain, managed by the Department of the Interior. At that time the area around Campbell Tract was part of the public domain or "public lands." In I942, Harold Ickes, then Secretary of the Interior, issued Public Land Order (PLO) No. 5, which transferred approximately 7,680 acres of public domain land near Anchorage to the War Department (*USDI 1998*).

The War Department was interested in this parcel of land as an auxiliary airfield, which would be necessary if a military attack occurred on the main bases in Anchorage. In 1942, the Army built an access road fording Campbell Creek and constructed the 5,000-foot gravel runway and associated taxiways. The army named the new facility Campbell Airfield (Figure 3). After the war the area was named Campbell Creek Range and Maneuver Site by the Army, but was commonly referred to as Campbell Tract. In June of 1965 the Department of the Interior withdrew 160 acres from the Campbell Creek Range and Maneuver Site for an administrative site. That year the BLM administrative offices and the Campbell Creek Fire Control Station were constructed. The Alaska Division of Fire Control operated out of the administrative offices at Campbell Tract and used the airstrip in support of fire operations.

By 1971 the Army determined that the Campbell Creek Range was no longer necessary and relinquished most of the original PLO to the BLM. The BLM took over administration of the 5,000 acre Campbell Tract Facility that included the airstrip and the surrounding undeveloped area.

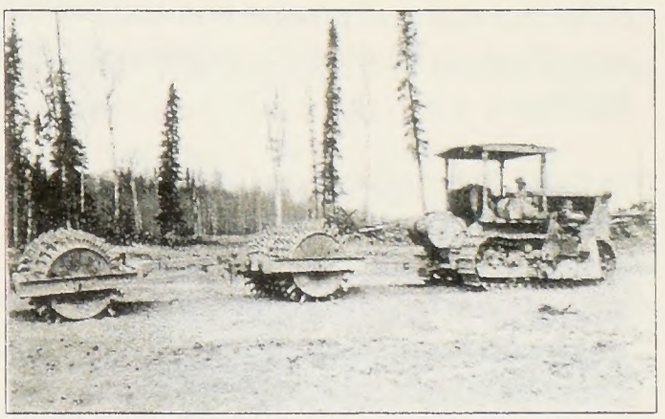

Figure 3. Campbell Creek Satellite Field August 8, 1942

In 1974, representatives from the Mayor's Office, the Governor's Office, and the BLM State Director developed a plan to use and manage old military lands. The group soon completed a plan for the proposed FNBP. Based on this plan, the United States Congress passed a law

directing the Secretary of the Interior to convey part of Campbell Tract to the State of Alaska. The transfer was completed

in 1980 and 4,325 acres were trensfered to the State (BLM retained 730 acres). The transfer required that the land be used in accordance with the FNBP master plan. In 1981, with the BLM's approval, most of the FNBP lands were transferred from the State of Alaska to the Municipality of Anchorage.

Today, BLM works with local city officials to ensure that the FNBP is managed in harmony with the Campbell Tract lands. The lands are managed for non-motorized public recreation (*Littlepage 1998*). Trails used for dog mushing, cross-country skiing, horseback riding, running, mountain biking, and hiking cover much of the area.

The Campbell Airstrip is occasionally used during the summer months in support of Fire Service operations and resource missions. Despite minimal use, the airfield is invaluable to the Municipality of Anchorage and private and commercial aircraft as an emergency aviation support facility.

In 1987, the Anchorage Committee for Resource Education proposed the construction of an outdoor recreation and educational facility on the Campbell Tract. BLM incorporated the proposal into the Campbell Tract management plan and worked with the Anchorage School District and the Municipal Parks and Recreation Department to develop an outdoor recreation and education center.

In 1993 the environmental education center development plan was approved for implementation. In 1996 the Campbell Creek Science Center opened it doors to the students of Alaska (Figure 4).

Figure 4. Campbell Creek Science Center

Climate

Anchorage has a transitional maritime climate where summers are cool and winters are cold. Mean January temperatures for Anchorage are 13°F (-10.5°C) and mean July temperatures are 58°F (14°C). The average high temperature in the summer months is 65°F (18.3°C), the average low is 51°F (10.5°C). The average high temperature in January is 20°F (-6.6°C) and the average low is 6°F (-14.4°C).

Anchorage receives 15.9 inches (40.4 cm) of annual precipitation, most of which falls during August and September. Snowfall averages 69.3 inches (176 cm) per year. The amount of daylight averages from a low of about 5.5 hours in mid-December to a high of 19.3 hours in June (*Municipality of Anchorage 1996*).

Recreation

The Campbell Tract Facility and Far North Bicentennial Park provide unique recreational opportunities for the citizens of Anchorage. Miles of marked trails are available for dog mushing, cross-country skiing, hiking, mountain biking, and horseback riding (Figure 5).

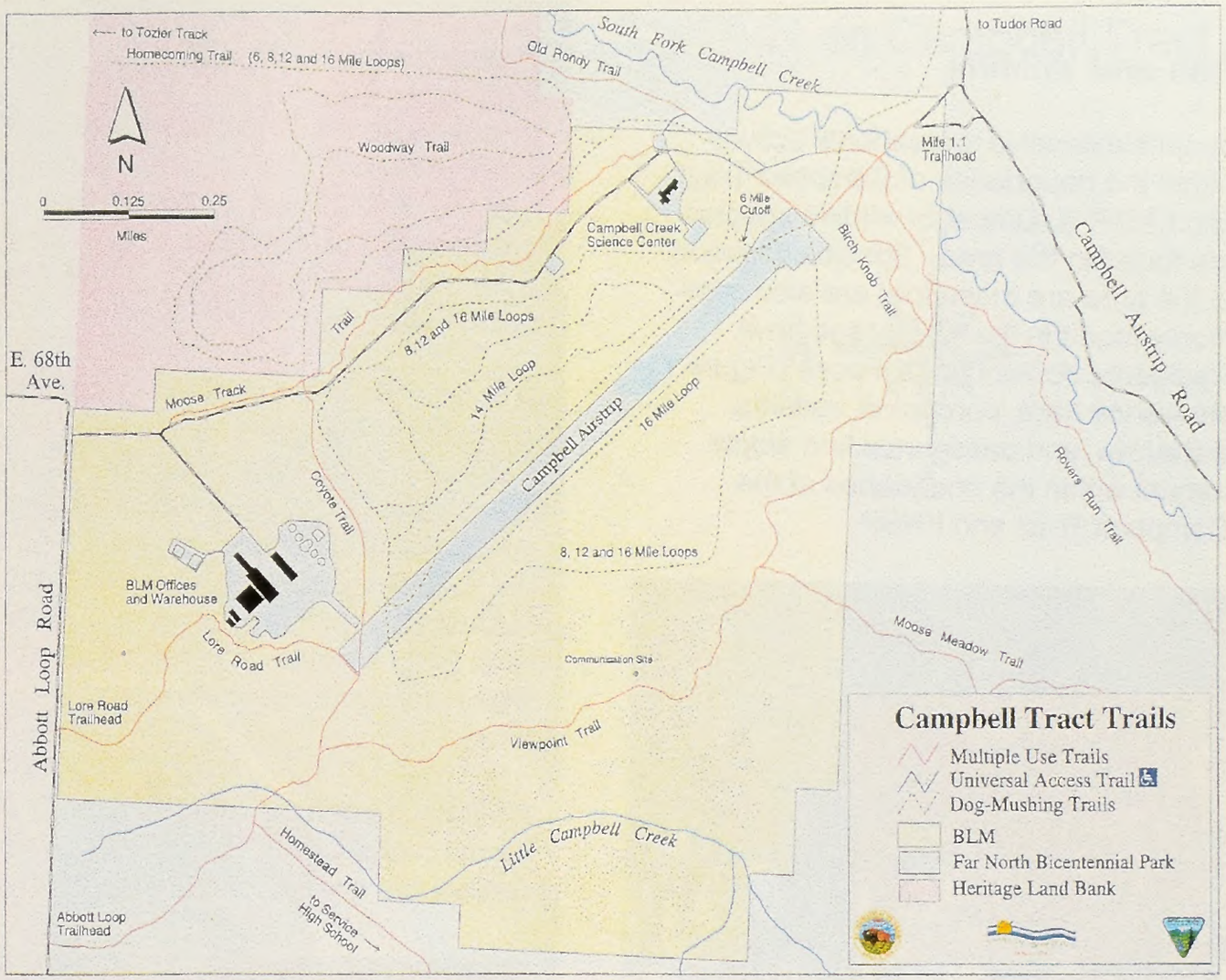

Figure 5. Campbell Tract trails

During the summer months all trails are available for use by runners, mountain bikers, hikers and horseback riders (Figure 6). Certain trails are designated specifically for dog use during the winter months. The dog sled trail system covers approximately five miles of the inner and outer loop trails. Skijoring and cross-country skiing are also popular winter activities at Campbell Tract. The Campbell Tract trails are occasionally used for competitive events. The Alaska Sled Dog Racing Association uses the dog sledding trails for their special events. The association grooms and maintains the trails during the winter season (Figure 6). Some trails are also used for cross-country skiing and foot racing competitions. Campbell Tract is the most widely and intensively used recreational facility presently operated by the BLM in the State of Alaska.

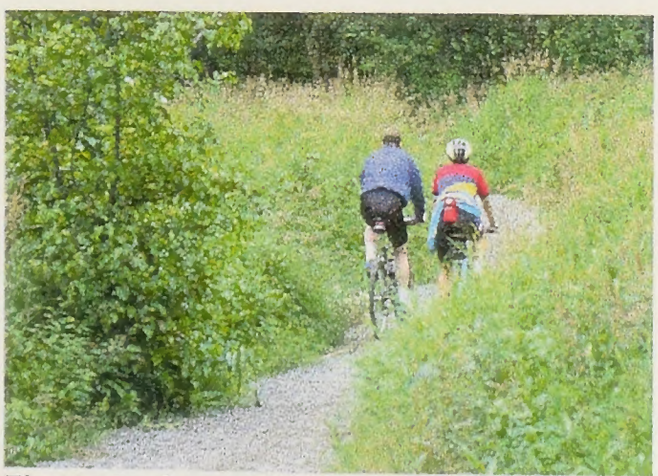

Figure 6. Campbell Tract bike Trails.

Fish and Wildlife

Despite extensive recreational activity within the boundaries of Campbell Tract and FNBP, a number of wildlife species are found in the area. Species common to the area are those that are also commonly found in the Anchorage bowl. Resident populations of moose (Figure 7), snowshoe hare, porcupine, rodents, waterfowl, and passerines find ample habitat within the boundaries of the Campbell Tract and FNBP.

Figure 7. Resident moose

Non-resident species that move in and out of the area include black bear, grizzly bear, lynx, fox, and wolf. Many of the non-resident species move into the area seeking shelter and food during certain months of the year. The area supports approximately 28 species of resident birds and a number of seasonally nesting and migrating birds (*Hogan and Tandy 1982*). Campbell Creek supports small populations of rainbow and Dolly Varden trout. A small population of silver and king salmon has also been found in Campbell Creek. Threatened and endangered species that frequent Campbell Tract include northern lynx, northern goshawk, and the harlequin duck (*USDI 1993*).

Wetlands

In April 1996, the Municipality published its Anchorage Wetlands Management Plan (AWMP). The plan designated approximately 111.5 acres of wetlands within the boundaries of Campbell Tract for preservation.

This acreage generally follows the riparian areas along Campbell Creek and Little Campbell Creek (Figure 9). The State's preservation designation emphasizes minimal alterations and modifications to the natural movements of surface and subsurface water. Management guidelines for this wetlands category are to leave the area undeveloped and unaltered.

Filling in a portion of these wetlands might be permitted if the action will enhance or restore the site's function and values

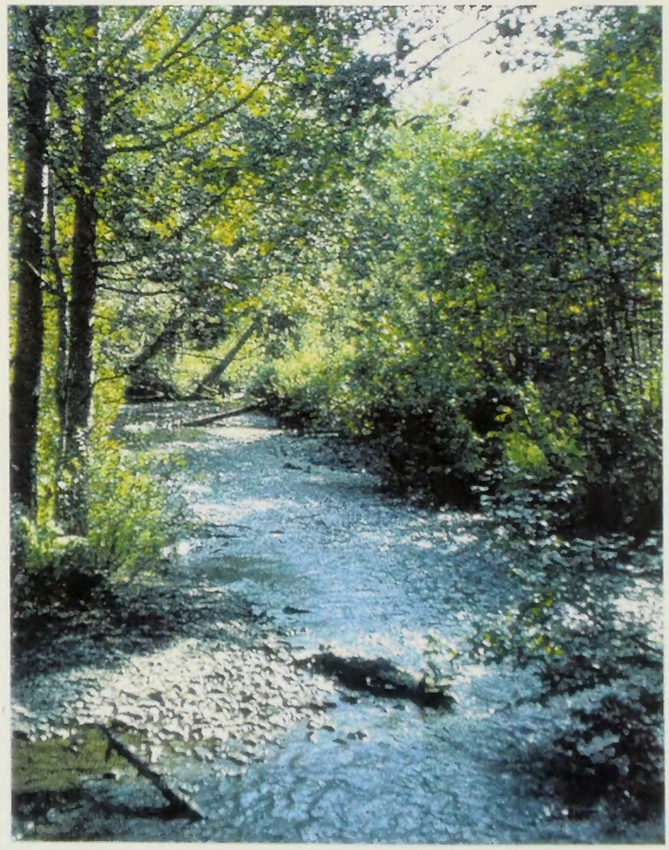

Figure 8. Campbell Creek

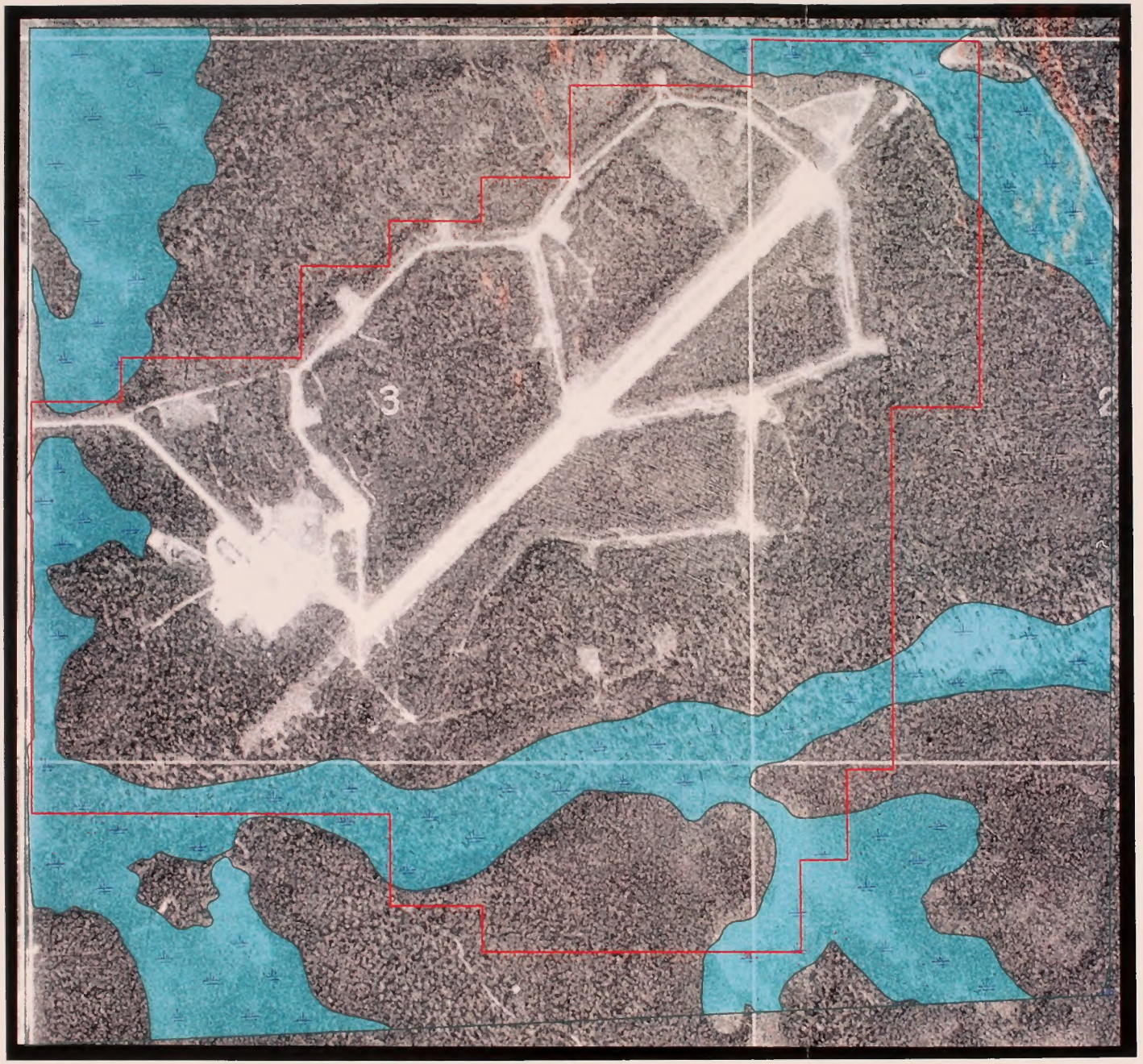

Figure 9. Wetland Designation on Campbell Tract

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Wetlands Designation Catagory "A" Preservation

Campbell Tract Boundary

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Part 2. Vegetation Classification

Vegetation inventories were conducted on the Campbell Tract in 1997, 1998, and 1999. The purpose of the surveys was to provide the Anchorage Field Office with baseline information about the type of vegetation and to describe vegetation distribution and abundance in the Campbell Tract and surrounding FNBP (Figure 10). This information will provide management with the opportunity to make decisions about future uses and their impacts based on sound knowledge of the existing environment.

Figure 10. Dwarf Dogwood (Cornus canadensis).

Methods

Vegetation cover type boundaries (map units) were determined by examining stereoscopic imagery for vegetation signature, patterns, and texture. Natural on-the-ground division breaks were also examined in the field to determine vegetation boundaries. Map units were drawn on a mylar-coated color infrared (CIR) aerial photograph at a scale of 1:6,000 (Figure 11). Vegetation cover types are basic units of vegetation classification based on the structure and species composition of the site (*USDI 1996*). Vegetation sample sites within vegetation cover types were located using a Global Positioning System (GPS), Rockwell PLGR receiver.

Field vegetation classifications, species description data, and digital photographs were collected at each field site (*Johnson et al. 1995, Hulten 1968, Pratt 1991, Viereck and Little 1972*). Site information was recorded on a data sheet adapted from the Natural Resource Conservation Service's (NRCS) 1999 soil and vegetation survey project of the Delta Wild and Scenic River (Figure 12). Plant species codes recorded on the data sheets were taken from the Alaska Plants Database (*U.S. Department of Agriculture 1994*). Each major stratum or layer of vegetation was recorded using codes for height class and canopy closure of the dominant species (*Clark and Kautz 1999*).

Areal cover was measured by the amount of canopy area that a species occupied within its stratum. This is a common method used for measuring and describing the composition of a plant community (Elzinga et al. 1998). A plotless reconnaissance technique was used to determine the percentage canopy cover of each species at each sample site. At each sample site within the vegetation cover type, data were collected on a homogeneous area, large enough to encompass all represented species and their variability. Each species was recorded and its percent cover per height class (stratum) was estimated. After the fieldwork was complete, the data sheet for each site (Figure 13) was reviewed and a vegetation class based on vegetative structure and composition was derived (Viereck et al. 1992).

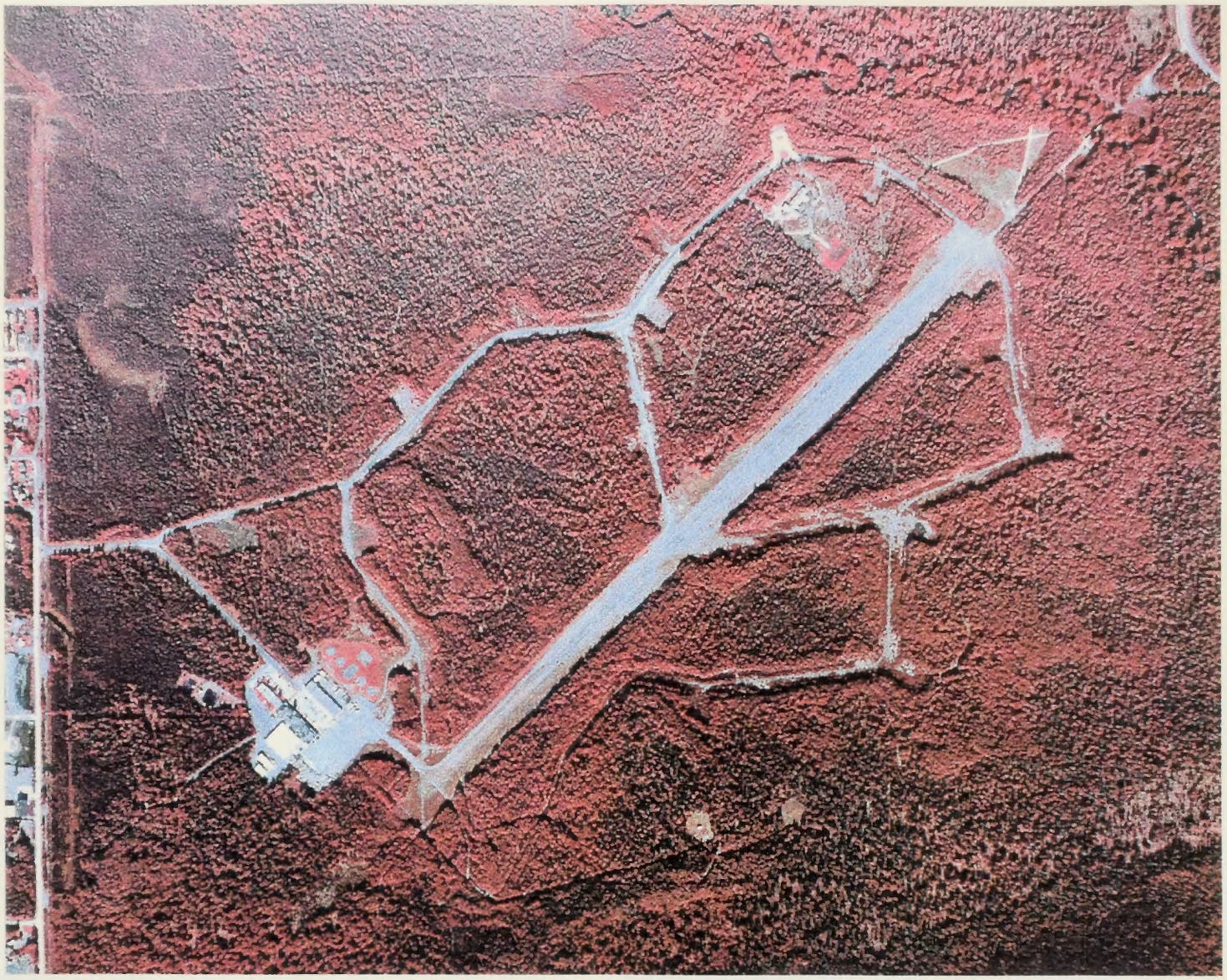


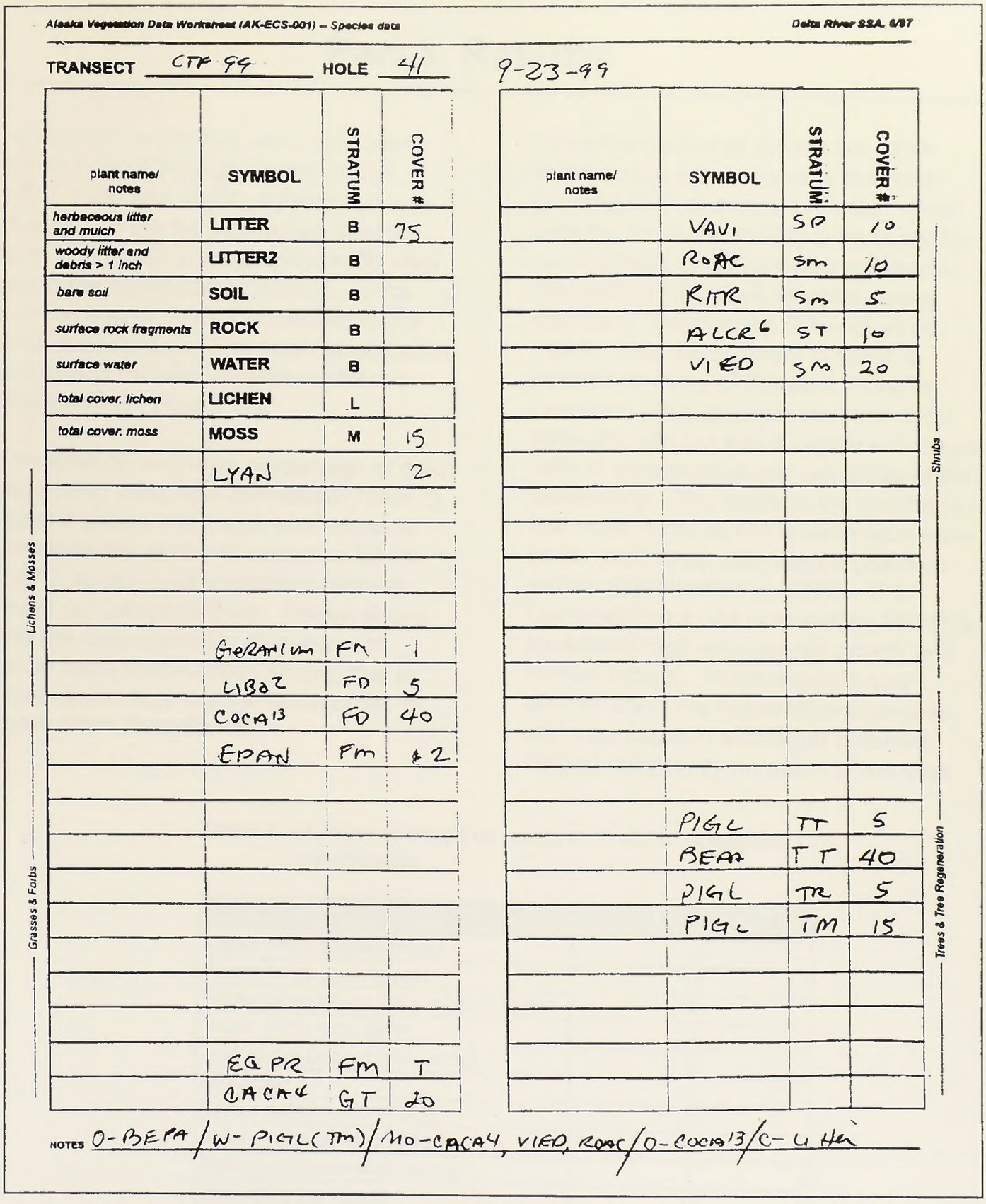
Figure 11. Aerial view of Campbell Tract, August 1997

Frequency of occurrence, average canopy cover, and variability within each class was calculated. Final vegetation map unit polygons were transferred from the CIR base map to a black and white orthophoto for scanning and subsequent acreage calculations.

Figure 12. Recording stand descriptions

Products

Hard copy and electronic copies of this report including plates, figures, and map data have been made available to the Anchorage District Office and can also be obtained from the Office of External Affairs, Alaska State Office, BLM, Anchorage. Mylar overlays, color infrared photography, original field data, and orthophotos used in the development of this report are on file in the Mapping Division, Alaska State Office, BLM, Anchorage.



Alaska Vegetation Data Worksheet (AK-ECS-001) – Species data — Delta River SSA, 6/97

TRANSECT CTF 99 HOLE 41 9-23-99

plant name/ notes	SYMBOL	STRATUM	COVER %
herbaceous litter and mulch	LITTER	B	75
woody litter and debris > 1 inch	LITTER2	B	
bare soil	SOIL	B	
surface rock fragments	ROCK	B	
surface water	WATER	B	
total cover, lichen	LICHEN	L	
total cover, moss	MOSS	M	15
	LYAN		2
	GERANIUM	FM	1
	LIBO2	FD	5
	COCA13	FD	40
	EPAN	FM	2
	EQPR	FM	T
	CACA4	GT	20

plant name/ notes	SYMBOL	STRATUM	COVER %
	VAVI	SP	10
	ROAC	SM	10
	RITR	SM	5
	ALCR6	ST	10
	VIED	SM	20
	PIGL	TT	5
	BEAL	TT	40
	PIGL	TR	5
	PIGL	TM	15

Grasses & Forbs — Lichens & Mosses — Shrubs — Trees & Tree Regeneration

NOTES O-BEPA / W-PIGL(TM) / MO-CACA4, VIED, ROAC / O-COCA13 / C-LIHE

Figure 13. Field data collection form

Part 3. Results

Vegetation inventories were conducted during August through September in 1997, 1998 and 1999. Information was collected in the form of written descriptions and digital photographs on 86 sites within the survey area (Table 1). Data from all survey years contributed to the final classification. The final classification resulted in thirteen vegetation classes (Appendix B)(Figure 14).

The acreage and area percentage of each vegetation class was calculated (Table 2). Table 2 shows that paper birch classes dominate the area and comprise 82.4% (537.2 acres) of all vegetative classes found on Campbell Tract. Observations into the successional progression of paper birch communities shows, that in most cases, they are the result of fire or some other disturbance.

Often the birch and spruce are established at the same time and the faster growing birch dominates the site. Over time the birch community is replaced by spruce-birch mixtures which are eventually replaced by black or white spruce dominant communities (*Viereck et al. 1992*). This replacement process is evident on many of the sites found on Campbell Tract in which the birch dominates the site but has a significant component of spruce trees and seedlings in the understory. This leads to the conclusion that most, if not all of the birch sites have yet to reach their potential natural community (*Gebhardt et al. 1990*). The Campbell Tract and surrounding FNBP is an area of high recreational activity and human impact. These impacts may directly affect the successional process and may result in a different potential natural community on many of the sites.

Table 1. Number of sites that occurred in each vegetation classification.

Vegetation Class	Number of Sites
Paper birch closed forest	7
Paper birch open forest	11
Paper birch/white spruce open forest	9
Paper birch woodland	4
Low shrub birch mixed scrub	6
Disturbed	2
Sweet gale/bluejoint bog	1
Balsam poplar closed forest	2
Balsam poplar/willow scrub	2
Spruce/moss forest	18
White spruce/paper birch forest	21
White spruce woodland	2
Black spruce/greenleaf alder forest	1
Total # of Sites	**86**

Table 2. Acres and percentage of vegetation classes within the Campbell Tract and survey area.

Vegetation Class	Campbell Tract		Survey Area	
	Acres	%	Acres	%
Paper birch closed forest	83.4	12.8%	130.6	10.8%
Paper birch open forest	152.9	23.5%	179.4	14.8%
Paper birch/white spruce open forest	56.1	8.6%	137.9	11.4%
Paper birch woodland	39.1	6.0%	55.4	4.6%
Low shrub birch mixed scrub	6.3	1.0%	25	2.1%
Disturbed	8.2	1.3%	8.2	0.7%
Sweet gale/bluejoint bog	0	0.0%	2.4	0.2%
Balsam poplar closed forest	9.6	1.5%	9.6	0.8%
Balsam poplar/willow scrub	3.9	0.6%	3.9	0.3%
Spruce/moss forest	82.1	12.6%	299.5	24.7%
White spruce/paper birch forest	205.7	31.5%	355.1	29.2%
White spruce woodland	4.7	0.7%	4.7	0.4%
Black spruce/greenleaf alder forest	0	0.0%	2.8	0.2%
Total	**652**	**100.0%**	**1,214.5**	**100.0%**

Classification

The final results of the vegetation classification on the Campbell Tract are: 31.5% white spruce/paper birch forest, 23.5 % paper birch open forest, 12.8% paper birch closed forest, 12.6% spruce/moss forest, 8.6% paper birch/white spruce open forest, 6.0% paper birch woodland, 1.5% balsam poplar closed forest, 1.3% disturbed, 1.0% low shrub birch mixed scrub, 0.7% white spruce woodland, and 0.6% balsam poplar/willow scrub (Table 2). The class having the highest diversity (greatest number of species in the class) was paper birch open forest with 36 different species (Table 3). Classes that also show a high degree of diversity were: paper birch/white spruce open forest with 35 species, white spruce/paper birch forest with 35 species, spruce/moss forest with 32 species, paper birch closed forest with 30 species, and low shrub birch mixed scrub with 28 species. There were a total of 72 species found on the Campbell Tract and surrounding surveyed area (Appendix C).

Table 3. Sum of species that occurred in each vegetation class.

Vegetation Class	Number Of Species
Paper birch closed forest	30
Paper birch open forest	36
Paper birch/white spruce open forest	35
Paper birch woodland	25
Low shrub birch mixed scrub	28
Disturbed	24
Sweet gale/bluejoint bog	9
Balsam poplar closed forest	10
Balsam poplar/willow scrub	16
Spruce/moss forest	32
White spruce/paper birch forest	35
White spruce woodland	17
Black spruce/greenleaf alder forest	12
Total # of Species	**72**

Accuracy Assessment

In large area vegetation mapping projects, the accuracy of the final classification is often in question. Because many areas are classified by computer models an assessment of its accuracy is necessary to validate the data (*USDI 1999*). By comparison this vegetation survey effort was relatively small. Due to its small size, all vegetation types were visited and verified with on-the-ground field analysis. No sites were assigned a class based on computer-generated models or photointerpretation, as is often the case in large projects. Thus, an accuracy assessment was not required to verify computer-generated results.

Final Products

The primary product of this project is a vegetation classification including the associated figures, tables. These will assist in explaining the classification map which displays the pattern and distribution of the classes on the landscape (Figure 14).

Hard copy maps of the project area were produced in the form of a 1:6,000 color infrared photograph and 1:6,000 scale orthophoto. Site write-up data sheets were also produced for each of the 86 sites visited. All hard copy maps, data sheets, and photographs are on file with the Bureau of Land Management, Mapping Section.

Figure 14. Campbell Tract Vegetation Classification

N
W E
S

- B1 Paper birch closed forest
- B2 Paper birch open forest
- B3 Paper birch/white spruce open forest
- B4 Paper birch woodland
- B5 Low shrub birch mixed scrub
- D1 Developed
- D2 Disturbed
- G1 Sweetgale/bluejoint bog
- P1 Balsam popular closed forest
- P2 Balsam popular/willow scrub
- S1 Spruce/moss forest
- S2 White spruce/paper birch forest
- S3 White spruce woodland
- S4 Black spruce/greenleaf alder forest

Campbell Tract Boundary

0 .25 .5
Miles

Part 4. Management Implications

It would be incorrect to infer that any classification system is an end in itself. Ecosystems by their very nature have multiple, or even infinite natural variations (*West and Shute 1978*). In practice we are assuming that one variable, this vegetation survey, describes a significant component of the ecosystem of Campbell Tract. This vegetation survey includes important information that will assist in planning and management.

The existing plant community is one key indicator in determining the health of the environment. Knowledge of potential natural communities will provide a basis for evaluation of environmental changes due to increasing public use, fire damage, soil erosion, wildlife population dynamics, insect infestations and other factors.

The vegetation classes described here will remain over time, regardless of changing management priorities or environmental conditions. It is recognized that the classification map is dated and the distribution and pattern of vegetation will vary over time.

Each vegetation class provides information on different levels of cover, browse, and habitat for wildlife. The final vegetation map will aid investigations into fire susceptibility, fuel load, and burn rates. Mapping the vegetation of Campbell Tract provides the necessary information to address recreational trail locations while avoiding sensitive wetlands and wildlife habitat. The information found in this report will aid in determining which mix of public uses and resource management actions are most appropriate.

Part 5. References and Glossary

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Glossary

Areal cover-A measure of dominance that defines the degree to which above ground portions of plants cover the ground surface. It is possible for the total areal cover for all strata combined in a community or single stratum to exceed 100 percent because: 1) most plant communities consist of two or more vegetative strata; 2) areal cover is estimated by vegetative layer; and 3) foliage within a single layer may overlap.

Bog- A peat-forming ecosystem influenced solely by water, which falls directly onto it as rain or snow. Bog vegetation is predominantly herbs, shrubs and stunted trees.

Boreal Forest- The geographical area just below the arctic tundra and usually characterized by evergreen forests.

Canopy- The cover of leaves and branches formed by the tops or crowns of plants as viewed from above.

Canopy cover- The proportion of the ground area covered by the vertical projections of the canopy, expressed as a percent.

Co-dominant trees- Trees whose crowns form the general level of the forest canopy and that receive full light from above but comparatively little from the sides.

Cover type- A unit of vegetation essentially similar in composition and development throughout its extent.

Crown-The upper part of a tree or shrub, including the living branches and their foliage.

Criteria- Technical requirements upon which a judgment or decision may be based.

Disturbed condition- As used herein, this term refers to areas in which indicators of one or more characteristics (vegetation, soil, and or hydrology) have been significantly altered by man's activities or natural events.

Dominant trees- Trees whose crowns form the general level of the forest canopy and that receive full light form above and from the sides.

Duff-The matted, partly decomposed organic surface layer of forested soils.

Ecological site- A kind of range or forest land with a specific potential natural plant community and specific physical site characteristics.

Ericaceous- Refers primarily to the Heath family, Ericaceae –for example, Labrador tea (*Ledum spp.*) but usually includes the Crowberry family, *Empetraceae*.

Flood plain- A nearly level alluvial plain that borders a stream and is subject to inundation under flood-stage conditions unless artificially protected.

Forb- Any herbaceous plant that is not a grass or a sedge.

Forest cover- All trees and other woody plants covering the ground in a forest.

Forest type- A unit of forest vegetation essentially similar in composition and development throughout its extent.

Frequency (vegetation)- The distribution of individuals of a species in an area.

GIS-(Geographic Information System) The use of spatial digital computer data to assist in management decision making.

GPS-(Global Positioning System) A space based navigation system that utilizes satellite signals to determine locations on the earth.

Graminoids- Grasses and grass-like plants such as sedges and rushes.

Hedging-Consistent browsing of a shrub's terminal buds by wildlife, resulting in excessive lateral branching and reduction in upward growth.

Herb- Grasses, sedges, forbs and any other non-woody herbaceous plants.
Hydric soil-Soils that are saturated, flooded or ponded long enough during the growing season to develop conditions that favor hydrophytic vegetation.
Hydrophytic vegetation- The total plant life growing in water or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content.
Litter- The partially decomposed plant and animal material found above the duff layer on the forest floor.
Map Unit- A portion of a map that depicts an area having some common characteristics.
Mulch- A covering of decomposing leaves or organic matter that covers the soil surface and slows evaporation and erosion, and enriches the soil.
Organic matter- Plant and animal residue in the soil in various stages of decomposition.
Overstory- Trees in a forest that form the upper canopy layer or layers.
Palustrine- Wetlands dominated by trees, shrubs, persistent emergents, mosses or lichens.
Passerines- Pertaining to or designating birds of the order Passeriformes, which includes perching birds and songbirds.
Permafrost- Ground, soil or rock that remains at or below 0° C for at least two years. It is defined on the basis of temperature and not necessarily being frozen.
Plant community- The plant populations existing in a shared habitat or environment.
Potential natural community- The biotic community that would become established if all successional sequences were completed without interference by human beings under the present environmental conditions. Synonyms: potential plant community, climax plant community and plant association.
Regeneration- The new growth of a natural plant community, developing from seed.
Riparian association- A cover type representing the latest successional stage attainable on a specific hydrologically influenced riparian zone site.
Riparian or Riparian zone- Land in close proximity to a water course, lake or spring and influenced by surface and ground water during all or part of the year.
Sapling- A young tree.
Scrub- Straggly stunted trees and shrubs.
Seedling- A young tree that is generally less than 3 feet high.
Shrub- Woody vegetation that retains its woody structure between years.
Species- A single, distinct kind of plant or animal having certain distinguishing characteristics.
Stratum- A layer of vegetation used to determine dominant species in a plant community.
Taxonomy- The science dealing with the identification, naming, and classification of organisms.
Terrace- An old alluvial plain, ordinarily flat or undulating, bordering a river, lake or ocean.
Understory- Any plant in a forest or scrub community that grows below, and is partially shaded by, the tree or shrub overstory.
Upland- Land at a higher elevation, in general, than the alluvial plain or stream terrace
Vegetation Structure- How the vegetation is arranged in a three-dimensional space.
Vegetation Unit- A patch, grouping or zone of plants evident in overall plant cover, which appears distinct from other such units due to the vegetation's structure and floristic composition.
Wetlands- Areas under normal circumstances having hydrophytic vegetation, hydric soils and wetland hydrology.

Part 6. Appendices

Appendix A: Terminology in Cover Type Descriptions

Vegetation Cover Type. The vegetation cover type is a basic unit of vegetation classification and represents a type of vegetation with relatively uniform structure and composition. Each cover type is distinguished by the dominant and co-dominant plant species in the major strata (*Clark and Kautz 1999*). Major catagories of cover types that were found on the Campbell Tract are:

Forest. Needleleaf or broadleaf vegetation with greater than 25 percent tree canopy cover. Mature tree stands will range in height from 15 to 60 feet or more.

Woodland. Tree canopy cover is between 10 to 24 percent range. The understory dominates most of this vegetation unit.

Scrub. Trees make up less than 10 percent of vegetative cover. Shrub or stunted tree canopy cover is greater than 25 percent.

Classification names were derived from the one or two most important species in the dominant or tallest stratum (Clark and Kautz 1999). Occasionally, a species in a lower stratum dominates the entire site, and therefore is included in the classification name. Each classification are uniquely named and have characteristics which differentiate them from other classes. Vegetation classification for the Campbell Tract are found in Appendix B.

CANOPY CLOSURE TERMS USED FOR COVER TYPES

Closed	= 76 -100 percent canopy cover
Moderately closed	= 61 - 75 percent canopy cover
Moderately open	= 46 - 60 percent canopy cover
Open	= 26 - 45 percent canopy cover
Woodland	= 10 - 25 percent canopy cover

STRATUM: The horizontal layer in which the taxon is found. Trees and shrubs often cross strata boundaries. The stratum most representative of the species in the cover type is identified in the summary tables.

TT = Tall trees generally greater than 40 ft. tall
TM = Medium trees generally between 15 - 40 ft. tall
TS = Stunted trees generally less than 15 ft. tall
TR = Regeneration trees generally less than 15 ft. tall
ST = Tall shrubs generally greater than 10 ft. tall
SM = Medium shrubs between 3 - 10 ft. tall
SL = Low shrubs between 8 inches and 3 ft. tall
SD = Dwarf shrub generally less than 8 inches tall
GT = Tall graminoids generally greater than 2 ft. tall
GM = Medium graminoids generally less than 2 ft. tall
FT = Tall forbs generally greater than 2 ft. tall
FM = Medium forbs between 4 inches and 2 ft. tall
FD = Dwarf herbs generally less than 4 inches tall
L = Foliose, fruticose and crustose lichens
M = Mosses; total Bryophytes
B = Barren; litter/mulch, woody litter, water, rock and soil

CON - percent constancy; relative consistency of occurrence of taxon. Calculated as:

$$\frac{\textit{number of stands in which a taxon occurred}}{\textit{Total number of stands}} \textit{ (X100)}$$

AVG - average canopy cover in those stands in which a taxon occurred. Calculated as:

$$\frac{\textit{sum of COVER across stands}}{\textit{number of stands in which the taxon occurred}} \textit{ (X100)}$$

Min = minimum canopy cover; minimum cover across stands

Max = maximum canopy cover; maximum cover across stands

IMP = importance value of taxon in vegetation type and is calculated as:

$$\textit{square root of (CON X AVG)}$$

note: importance values are useful for comparing taxa within vegetation type but not for comparisons across types.

Appendix B: Vegetation Cover Type Classification

Balsam poplar closed forest
Populus balsamifera closed forest
POBA2

Balsam poplar/willow scrub
Populus balsamifera/Salix spp. scrub
POBA2/SALIX

Black spruce/greenleaf alder forest
Picea glauca/Alnus crispa forest
PIGL/ALCR6

Disturbed
Salix spp./Poa spp.
SALIX/POA

Low shrub birch mixed scrub
Betula glauca mixed scrub
BEGL

Paper birch closed forest
Betula papyrifera closed forest
BRPA

Paper birch open forest
Betula papyrifera open forest
BEPA

Paper birch/white spruce open forest
Betula papyrifera/Picea glauca open forest
BEPA/PIGL

Paper birch woodland
Betula papyrifera woodland
BEPA

Spruce/moss forest
Picea spp./moss forest
PICEA/MOSS

Sweetgale/bluejoint bog
Myrica gale/Calamagrostis canadensis bog
MYGA/CACA4

White spruce/paper birch forest
Picea glauca/Betula papyrifera forest
PIGL/BEPA

White spruce woodland
Picea glauca woodland
PIGL

Developed

Appendix C: Species List

Symbol	Genus/Species	Common Name
	Trees	
BEPA	*Betula papyrifera*	Paper Birch
PIGL	*Picea glauca*	White Spruce
PIMA	*Picea mariana*	Black Spruce
POBA2	*Populus balsamifera*	Balsam Poplar/Cottonwood
POTR5	*Populus tremuloides*	Quaking Aspen
	Shrubs	
ALCR6	*Alnus crispa*	Green Alder
ANPO	*Andromeda polifolia*	Bog Rosemary
ARRU	*Arctostaphylos rubra*	Red Bearberry
ARUV	*Arctostaphylos uva-ursi*	Kinnikinnick
BEGL	*Betula glandulosa*	Shrub Birch
BENA	*Betula nana*	Dwarf Birch
CHCA2	*Chamaedaphne calyculata*	Leatherleaf
EMNI	*Empetrum nigrum*	Black Crowberry
LEGR	*Ledum palustre*	Labrador Tea
MYGA	*Myrica gale*	Sweet Gale
OXMYI	*Oxycoccus microcarpus*	Cranberry
POFR4	*Potentilla fruticosa*	Shrubby Cinquefoil
RITR	*Ribes triste*	Northern Red Current
ROAC	*Rosa acicularis*	Arctic Rose
RUID	*Rubus idaeus*	Raspberry
SAAL	*Salix alaxensis*	Feltleaf Willow
SAPL2	*Salix planifolia*	Diamond Leaf Willow
SPBE	*Spiraea Beauverdiana*	Spiraea
VAUL	*Vaccinium uliginosum*	Alpine Blueberry
VAVI	*Vaccinium vitis-idaea*	Lowbush Cranberry
VIED	*Viburnum edule*	High Bush Cranberry
	Forbs	
ACMI2	*Achillea borealis*	Northern Yarrow
ACDE2	*Aconitum delphinifolium*	Monks Hood
ASSI	*Aster sibiricus*	Siberian aster (purplish)
COCA13	*Cornus canadensis*	Dwarf Dogwood
DEGL3	*Delphinium glaucum*	Larkspur
EPAN2	*Epilobium angustifolium*	Fireweed
GABO2	*Galium boreale*	Bedstraw
GELI2	*Geocaulon lividum*	Pumkin Berry
HELA	*Heracleum lanatum*	Cow Parsnip
LIBO3	*Linnaea borealis*	Twinflower
LUAR2	*Lupinus arcticus*	Arctic Lupine
MAMA	*Matricaria matricarioides*	Pineapple Weed
MEPA	*Mertensia paniculata*	Bluebells
PAPA8	*Parnassia palustris*	Grass of Parnassus

Forbs (continued)

PLMA	*Plantago major*	Common Plantain
POAC	*Polemonium acutiflorum*	Jacobs Ladder
POPA14	*Potentilla palustris*	Marsh Fivefinger
PYAS	*Pyrola asarifolia*	Pink Pyrola
PYGR	*Pyrola grandiflora*	
PYSE	*Pyrola secunda*	Sidebells Pyrola
RHMI	*Rhinanthus minor*	Rattlebox
RUAR	*Rubus arcticus*	Nagoon Berry
RUCH	*Rubus chamaemorus*	Cloudberry
SAST11	*Sanguisorba stipulata*	Sitka Burnet
SERO13	*Sedum rosea*	Roseroot
SENEC	*Senecio atropupureus*	Groundsel
TACE	*Taraxacum ceratophorum*	Dandelion
THSP	*Thalictrum sparsiflorum/alpinum*	Meadow Rue
TRRE	*Trifolium repens*	Clover
VIOLA	*Viola epipsila*	Marsh Violet

Ferns

DRDI	*Dryopteris dilatata*	Wood Fern
GYDR	*Gymnocarpium dryopteris*	Oak Fern

Horsetails

EQAR	*Equisetum arvense*	Field Horsetails
EQPR	*Equisetum pratense*	Meadow Horsetails
EQSY	*Equisetum sylvaticum*	Wood Horsetails

Clubmosses

LYAN2	*Lycopodium annotinum*	Stiff Clubmoss
LYCO3	*Lycopodium complanatum*	Creeping Jenny

Grasses

ARLA2	*Arctagrostis latifolia*	Polar Grass
CACA4	*Calamagrostis canadensis*	Bluejoint Grass
HIAL3	*Hierochloe alpina*	Holy Grass
POA	*Poa spp.*	Bluegrass

Sedges and Rushes

CAREX	*Carex spp.*	Sedge
CAAQ	*Carex aquatilis*	Water Sedge

Appendix D: Cover Type Descriptions

Balsam Poplar Closed Forest

***Populus balsamifera* Closed Forest**
POBA2

Description

Balsam poplar forest is dominated by *Populus balsamifera* in the tree layer where the canopy cover ranges from 50 to 60 percent. *Populus tremuloides* is present and contributes to the canopy as small patches throughout the site. *Picea glauca* exists as a secondary tree layer and in one site made up 20 percent of this stratum. *Alnus* is a common tall shrub. Litter, in the form of duff and decomposing poplar leaves, thoroughly covers the forest floor (Figure 15).

Setting

Two stands of this vegetation type were found on the Campbell Tract, both are located next to the runway. These areas are well drained and support tall trees due to their porous gravel soils.

Riparian-Wetland Status

Classification: Upland,
Both stands fall outside Anchorage Wetland Management plan (AWMP).

Figure 15. Closed broadleaf forest of Balsam Poplar with a tall shrub layer of Green Alder.

Balsam Poplar Closed Forest

Species Summary

Number of Stands = 2

Table 4.

			Cover			
Scientific Name	**Stratum**	**Con**	**Avg**	**Max**	**Min**	**Imp**
Populus balsamifera	TT	100%	27.5	60	50	5.2
Populus tremuloides	TT	100%	5	5	5	2.2
Picea glauca	TM	100%	12.5	20	5	3.5
Picea glauca	TR	50%	2.5	5	5	1.1
Alnus crispa	SM	100%	15	25	5	3.9
Ledum palustre	SL	50%	1.5	3	3	0.9
Comus canadensis	F	50%	2.5	5	5	1.1
Epilobium angustifolium	F	50%	T	T	T	T
Linneaea borealis	F	50%	T	T	T	T
Pyrola spp.	F	50%	T	T	T	T
Moss	M	100%	7.5	10	5	2.7
Litter	L	100%	80	90	70	8.9
Woody Litter	L	50%	7.5	15	15	1.9

(Note: "T"= Trace)

Balsam Poplar/Willow Scrub

Populus balsamifera./Salix planifolia **scrub**
POBA2/SAPL2

Description

Balsam poplar/willow scrub consists of open to moderately closed balsam poplar seedlings and willows ranging from 3 to 5 feet high. Two sites were found in the study area: one site was dominated by low growing *Populus balsamifera* below 3 feet tall; the other site consisted of even aged dense stands of *Populus balsamifera, Salix planifolia,* and *Populus tremulodies*.

The understory was characterized by a sparse layer of species, which include *Trifolium spp.* and *Poa spp.* Moss and litter dominate the ground layer (Figure 16).

Setting

These two stands were found along gravel roads near disturbed areas. Most likely these stands were disturbed near the time of the original development but since then the shrubs and balsam poplar have regenerated. These sites are heavily hedged by the local moose population, which prevents the poplars from reaching tree status.

Riparian-Wetland Status

Classification: Upland,
Both stands fall outside AWMP wetlands boundaries.

Figure 16. Open dwarf tree scrub of Balsam Poplar and Diamond Leaf Willow (foreground).

Balsam Poplar/Diamondleaf Willow Scrub

Species Summary

Number of Stands = 2

Table 5.

			Cover			
Scientific Name	**Stratum**	**Con**	**Avg**	**Max**	**Min**	**Imp**
Populus balsamifera	TR	100%	47.5	50	45	6.9
Populus tremuloides	TR	50%	5	10	10	2.2
Picea glauca	TR	50%	2.5	5	5	1.6
Betula papyrifera	TR	50%	2.5	5	5	1.6
Salix planifolia	SM	100%	15	15	15	3.9
Potentilla fruticosa	SM	50%	0.5	1	1	0.5
Alnus crispa	SM	50%	5	10	10	2.2
Rosa acicularis	SM	50%	T	T	T	T
Spiraea beauverdiana	SM	50%	T	T	T	T
Arctostaphylos rubra	SD	50%	0.5	1	1	0.5
Poa spp.	G	50%	T	T	T	T
Achillea borealis	F	100%	T	T	T	T
Epilobium angustifolium	F	100%	T	T	T	T
Taraxacum ceratophorum	F	50%	2.5	5	5	1.1
Trifolium repens	F	50%	20	40	40	3.1
Moss	M	100%	42.5	50	35	6.5
Lichen	L	50%	7.5	15	15	1.9
Soil	B	50%	10	20	20	2.2
Litter	B	100%	35	40	30	5.9

Black Spruce/Green Alder Forest

***Picea glauca/Alnus crispa.* forest**

PIGL/ALCR6

Description

Black spruce/green alder forest consists of closed to moderately closed stands of *Picea mariana and Alnus crispa*; canopy cover was 70 percent for both species combined. *Alnus crispa* was tall (over 15 ft.) and *Picea* was fifteen to twenty feet tall. A sparse shrub layer and some patchy stands of *Calamagrostis canadensis* characterize the understory. The herb layer also was sparse with *Cornus canadensis* as the major component. Litter composed 70 percent of the ground cover with some patches of moss present (Figure 17).

Setting

Only one stand of this type was found within the Campbell Tract, along the Homecoming Trail, north of the airstrip.

Riparian-Wetland Status

Classification: Wetland Category A, Palustrine needle-leafed evergreen forest, intermittently flooded (Cowardin et al. 1979).

Figure 17. Open needleleaf forest with dense stand of tall Alder shrub.

Black Spruce/Green Alder Forest

Species Summary

Number of Stands = 1

Table 6.

			Cover			
Scientific Name	**Stratum**	**Con**	**Avg**	**Min**	**Max**	**Imp**
Betual papyrifera	TT	100%	5	5	5	2.2
Picea mariana	TM	100%	35	35	35	5.9
Alnus crispa	ST	100%	40	40	40	6.3
Ribes trist	SM	100%	T	T	T	T
Viburnum edule	SM	100%	T	T	T	T
Spiraea beauverdiana	SM	100%	T	T	T	T
Comus canadensis	F	100%	10	10	10	3.2
Galium boreale	F	100%	T	T	T	T
Heracleum lanatum	F	100%	T	T	T	T
Dryopteris dilatata	F	100%	2	2	2	1.4
Calamagrostis canadensis	G	100%	10	10	10	3.2
Moss	M	100%	10	10	10	3.2
Water	W	100%	5	5	5	2.2
Litter	B	100%	70	70	70	8.4
Woody litter	B	100%	10	10	10	3.2

Disturbed

Salix spp./Poa spp.

Salix/Poa

Description

A sparse to medium shrub layer of *Salix spp.* and *Alnus crispa* characterizes the areas described as Disturbed. Invader species include *Achillea spp., Nelsia paniculata* and *Taraxacum spp.* Graminoids that were dominant in the herb layer were *Calamagrostis canadensis, Poa spp.* and *Agrostis scabra*. Medium and lower shrubs were not present. The herb layer was dominated by litter and bare ground (Figure 18).

Setting

Two disturbed areas were large enough to map within the project boundaries. The disturbance originates from the development of the road and airstrip in the early 1940's. These sites were historically used as staging areas for aircraft.

Riparian-Wetland Status

Classification: Upland,
Both stands fall outside AWMP wetlands boundaries.

Figure 18. *Calamagrostis canadensis* and *Agrostis scabra* invade cleared area along gravel road.

Disturbed

Species Summary

Number of Stands = 2

Table 7.

			Cover			
Scientific Name	Stratum	Con	Avg	Min	Max	Imp
Picea glauca	TR	50%	2.5	0	5	1.1
Betula papyrifera	TR	100%	0.5	T	10	0.7
Populus balsamifera	TR	100%	12.5	5	20	3.5
Populus tremuloides	TR	50%	7.5	0	15	1.9
Alnus crispa	SM	100%	2.5	2	3	1.6
Salix planifolia	SM	50%	5	0	10	1.6
Rosa acicularis	SM	50%	2.5	0	5	1.1
Rubus idaeas	SM	50%	T	T	T	T
Calamagrostis canadensis	G	50%	30	0	60	3.9
Agrostis scabra	G	100%	20	10	30	4.5
Poa spp.	G	50%	2.5	0	5	1.1
Equisetum arvense	F	50%	15	0	30	2.7
Cornus canadensis	F	50%	0.5	0	1	0.5
Plantago major	F	50%	T	T	T	T
Taraxacum ceratophorum	F	100%	0.5	T	1	0.7
Potentilla gracilis	F	50%	0.5	0	1	0.5
Epilobium angustifolium	F	50%	T	T	T	T
Aster sibiricus	F	50%	T	T	T	T
Achillea borealis	F	100%	0.5	T	1	0.7
Moss	M	50%	5	0	10	1.6
Rock	B	50%	2.5	0	5	1.1
Soil	B	50%	20	0	40	3.2
Litter	B	50%	2.5	0	5	1.1

Low Shrub Birch Mixed Scrub

***Betula glandulosa* Mixed Scrub**
BEGL

Description

This vegetative class has at least 75 percent of it's total cover dominated by shrubs. Most trees were regeneration and provide less than 10 percent cover. *Betula glandulosa* dominates the shrub layer but other shrubs that significantly contribute to the canopy are *Potentilla fruticosa, Chamaedaphne calyculata, Ledum palustre, Myrica gale and Salix planifolia.*

Calamagrostis canadensis was dominant in all sites. The herb layer consisted of moss and litter. Either running or standing water was present in all sites (Figure 19).

Setting

The low shrub birch mixed class occurs in protected gullies and draingageways. These open shrub meadows are surrounded by *Picea mariana* forests that drain into the hydric soils found on these sites.

Riparian-Wetland Status

Classification: Wetland Category A, Palustrine broad-leaved deciduous scrub-shrub, saturated (*Cowardin et al. 1979*). All stands fall within AWMP wetland boundaries.

Figure 19. Closed low mixed birch shrub of *Betula glandulosa, Potentilla fruiticosa, Chamaedaphne calyculata, Ledum palustre* and *Myrica gale.*

Low Shrub Birch Mixed Scrub

Species Summary

Number of Stands = 6

Table 8.

		Cover				
Scientific Name	Stratum	Con	Avg	Min	Max	Imp
Picea glauca	TM	17%	1	7	7	0.4
Picea mariana	TM	66%	3	5	5	1.4
Picea mariana	TR	66%	5	15	5	1.8
Picea mariana	TS	17%	1	5	5	0.4
Betula papyrifera	TM	17%	T	T	T	T
Alnus crispa	SM	17%	2	10	10	0.6
Betula glandulosa	SM	100%	19	45	5	4.3
Potentilla fruticosa	SM	83%	15	30	5	3.5
Chamaedaphne calyculata	SM	34%	4	20	2	1.1
Ledum palustre	SM	100%	11	20	15	3.3
Myrica gale	SM	100%	15	20	10	3.9
Ribes triste	SM	17%	0.3	2	2	0.2
Salix planifolia	SM	83%	9	15	5	2.8
Spiraea beauverdiana	SL	17%	2.5	15	15	0.7
Empetrum nigrum	SD	17%	4.1	25	25	0.8
Vaccinium vitas-idea	SD	66%	3.2	10	2	1.4
Vaccinium uliginodum	SL	83%	2	5	T	1.3
Andromeda polifolia	SD	34%	0.5	3	T	0.4
Oxycoccus microcarpus	SD	50%	2.5	10	5	1.1
Calamagrostis canadensis	G	100%	27	60	5	5.2
Poa spp.	G	17%	1.7	10	10	0.5
Carex aquatilis	G	83%	18	50	5	3.9
Carex spp.	G	17%	3.3	20	20	0.7
Equisetum spp.	F	50%	2.5	10	T	1.1
Equisetum arvense	F	17%	0.8	5	5	0.8
Geocaulon lividum	F	17%	T	T	T	T
Potentilla palustris	F	34%	0.5	3	T	0.4
Epilobium angustifolium	F	17%	T	T	T	T
Parnassia palustris	F	17%	T	T	T	T
Moss	M	100%	51	60	25	7.1
Water	W	100%	6.2	15	T	2.5
Lichen	L	17%	T	T	T	T
Litter	B	100%	24	60	5	4.9

Paper Birch Closed Forest

***Betula paperifera* Closed Forest**
BEPA2

Description

Paper birch closed forest consists of dense stands of *Betula paperifera* that dominate the forest canopy. Tree canopy cover ranges from 30 to 65 percent of the overstory. Some 15 feet tall *Picea glauca,* regenerating *Betula paperifera* and *Alnus crispa* contribute to the understory.

The shrub stratum consists of *Rosa acicularis, Viburnum edule* and *Ribes triste*. *Cornus canadensis* and *Calamagrostis canadensis* make up the majority of the herb layer. Moss and especially litter is abundant in all stands. Litter in the form of leaf and leaf mulch is very dense and covers the majority of the soil surface (Figure 20).

Setting

The majority of Paper birch closed forest is found on the eastern side of Campbell Tract. The terrain characteristic of this cover type is level to gently undulating terraces.

Riparian-Wetland Status

Classification: Wetlands Category A, Palustrine broad-leaved deciduous, saturated (*Cowardin et al. 1979*). According to the AWMP a portion of this class falls within the wetlands A designation. Wetlands designated in the "A" category are considered as high value resources and are slated for preservation.

Figure 20. Closed broadleaf forest of Paper birch with a shrub layer of Artic Rose, Raspberry and Highbush Cranberry.

Paper Birch Closed Forest

Species Summary

Number of Stands =7

Table 9.

			Cover			
Scientific Name	**Stratum**	**Con**	**Avg**	**Max**	**Min**	**Imp**
Betula papyrifera	TT	100%	55	65	3	7.4
Populus balsamifera	TT	28%	2.1	10	5	0.8
Picea glauca	TT	28%	2.1	10	5	0.8
Populus tremuloides	TT	14%	T	T	T	T
Picea glauca	TM	57%	9.3	35	5	2.3
Betula papyrifera	TR	14%	2.8	20	20	0.6
Picea glauca	TR	28%	4.3	20	10	1.2
Alnus crispa	ST	57%	5	20	5	1.7
Rosa acicularis	SM	100%	7.1	20	T	2.7
Virburnum edule	SM	57%	7.3	30	1	2
Ribes triste	SM	86%	9.1	20	1	2.8
Rubus idaeus	SM	14%	T	T	T	T
Ledum palustrus	SM	28%	1.3	7	2	0.6
Salix planifolia	SM	28%	0.4	2	1	0.3
Vaccinium uliginosum	SM	14%	0.3	2	2	0.2
Vaccinium vitis-idaea	SD	43%	2.9	15	T	1.2
Empetrum nigrum	SD	14%	0.1	1	1	0.1
Calamagrostis canadensis	G	86%	6.4	15	1	2.3
Equisetum pratense	F	28%	0.7	5	T	0.4
Equisetum arvense	F	14%	0.1	1	1	0.1
Cornus canadensis	F	86%	24.7	65	3	4.6
Dryopteris dilitata	F	57%	2.1	10	T	1.1
Epilobium angustifolium	F	71%	1.6	5	1	1.1
Linnaea borealis	F	86%	2.4	5	T	1.4
Galium boreale	F	14%	T	T	T	T
Geranium erianthum	F	14%	0.1	1	1	0.1
Gymnocarpium dryopteris	F	28%	0.3	1	T	0.3
Heracleum lanatum	F	43%	1	5	T	0.6
Pyrola grandiflora	F	71%	8.6	45	T	2.5
Pyrola secunda	F	14%	0.3	2	2	0.2
Mertensia paniculata	F	14%	0.3	2	2	0.2
Lycopodium annotinum	F	43%	5.7	30	5	1.6
Moss	M	100%	15	30	5	3.8
Lichen	L	14%	T	T	T	T
Litter	B	100%	73.6	90	60	8.6
Woody Litter	B	57%	3.6	10	5	1.4

Paper Birch Open Forest

***Betula papyrifera* open forest**

BEPA

Description

Paper birch open forest consists of woodland to moderately open stands of *Betula papyrifera*. *Picea glauca* and *Populus tremuloides* are common in the overstory of many stands and are often well represented in the secondary tree layer. Tree canopy cover ranges from 20 to 40 percent. Paper Birch open forest includes mature stands of trees that may reach 50 or 60 feet in height. Stands include not only large trees but also small and advanced regeneration trees.

Salix spp. and *Alnus crispa* characterize the forest understory. These shrubs dominate the shrub secondary layer and cover ranges from 5 to 15 percent. Most stands have a sparse to moderately open low shrub layer. Important low shrubs include *Ledum palustrus* and *Viburnum edule*.

The herb layer is highly variable in Paper birch open forest. Herb canopy cover ranges from sparse to 70 percent in its stratum and includes a variety of low forbs. Important herbs and low growing shrubs include *Vaccinium vitis-idea, Lycopodium annotinum, Cornus canadensis, Pyrola spp.* and *Calamagrostis canadensis*. There was a moderate amount of leaf litter and mulch in most stands (Figure 21).

Setting

Paper birch open forest is mostly distributed around the gravel runway and taxi ways at Campbell Tract

Riparian-Wetland Status

Classification: Uplands,
A portion of this class along Campbell

Figure 21. Open broadleaf forest of Paper Birch with a shrub layer of Labrador Tea and Highbush Cranberry.

Paper Birch Open Forest

Species Summary

Number of Stands = 11

Table 10.

		Cover				
Scientific Name	**Stratum**	**Con**	**Avg**	**Max**	**Min**	**Imp**
Betula papyrifera	TT	91%	25.4	40	15	4.8
Populus balsamifera	TT	36%	4.5	20	5	1.3
Picea glauca	TT	54%	5.4	20	5	1.7
Populus tremuloides	TT	54%	5.4	15	5	1.7
Picea glauca	TM	36%	8.6	25	20	1.7
Picea mariana	TM	9%	1.7	15	15	0.4
Betula papyrifera	TR	36%	3.6	20	5	1.1
Picea glauca	TR	36%	1.8	15	T	0.8
Picea mariana	TR	18%	1.4	10	5	0.5
Populus balsamifera	TR	18%	T	T	T	T
Alnus crispa	ST	64%	5.6	20	5	1.9
Salix planifolia	ST	18%	0.1	1	T	0.1
Rosa acicularis	SM	64%	3.5	25	T	1.5
Virburnum edule	SM	27%	2.4	20	1	0.8
Ribes triste	SM	45%	1.3	5	T	0.8
Rubus idaeus	SM	9%	2.3	25	25	0.5
Ledum palustrus	SM	64%	10.3	30	1	2.6
Menziesia ferruginea	SM	18%	T	T	T	T
Salix planifolia	SM	36%	5.5	30	1	1.4
Vaccinium uliginosum	SM	9%	0.9	10	10	0.3
Vaccinium vitis-idaea	SD	82%	6.8	20	2	2.4
Empetrum nigrum	SD	18%	0.2	1	1	0.2
Calamagrostis canadensis	G	82%	13.4	20	T	3.3
Carex spp.	G	45%	0.4	2	T	0.4
Equisetum pratense	F	9%	0.5	5	5	0.2
Equisetum arvense	F	9%	T	T	T	T
Cornus canadensis	F	82%	31.8	70	5	5.1
Dryopteris dilitata	F	18%	0.1	1	1	0.1
Epilobium angustifolium	F	100%	1.1	3	1	1.0
Linnaea borealis	F	73%	4.1	15	1	1.7
Galium boreale	F	18%	T	T	T	T
Geocaulon lividum	F	27%	0.1	1	T	0.2
Heracleum lanatum	F	18%	1.4	15	T	0.5
Pyrola grandiflora	F	45%	1.3	5	1	0.8
Pyrola secunda	F	9%	T	T	T	T
Thalictrum sparsiflorum	F	9%	T	T	T	T
Senecio spp.	F	9%	T	T	T	T
Mertensia paniculata	F	9%	0.6	7	7	0.2
Lycopodium annotinum	F	64%	5.5	15	T	1.9
Lycopodium complanatum	F	27%	1.8	15	T	0.7
Moss	M	100%	26.4	70	5	5.1
Lichen	L	36%	0.5	5	T	0.4
Litter	B	10%	49.1	80	15	2.2
Woody Litter	B	27%	2.7	15	5	0.9

Paper Birch-White Spruce Open Forest

***Betula papyrifera/Picea glauca* Open Forest**
BEPA2/PIGL

Description

Paper birch/white spruce open forests consists of open stands of *Betual papyrifera, Picea glauca* and *Populus tremuloides. Betula papyrifera* dominates the majority of the canopy layer and averages over 20 percent cover per site. *Picea glauca* contributes significantly in the primary and secondary layers and averages just fewer than 10 percent on each site. *Populus tremuloides* is found in small patches throughout the vegetation type. Total tree canopy usually averages between 30 and 50 percent.

Rosa acicularis, Viburnum edule and ericaceous shrubs dominate the lower layer. *Calamagrostis canadensis* is a dominant grass on all sites. *Cornus canadensis*, moss and litter carpet the forest floor (Figure 22).

Setting

Paper birch-white spruce open forest is one of the most extensive vegetation types found throughout the Campbell Tract.

Riparian-Wetland Status

Classification: Upland,
A portion of this class along Little Campbell Creek falls within the AWMP wetlands boundary.

Figure 22. Open mixed forest of Paper Birch and White Spruce.

Paper Birch/White Spruce Forest

Species Summary

Number of Stands = 9

Table 11.

			Cover			
Scientific Name	**Stratum**	**Con**	**Avg**	**Max**	**Min**	**Imp**
Betula papyrifera	TT	100%	21.7	40	10	4.7
Picea glauca	TT	78%	9.4	15	5	2.7
Populus tremuloides	TT	44%	3.0	10	2	1.1
Picea mariana	TM	22%	2.8	15	10	0.8
Picea glauca	TM	44%	4.4	15	5	1.4
Betula papyrifera	TR	44%	0.4	2	T	0.4
Picea glauca	TR	55%	2.7	10	T	1.2
Alnus crispa	ST	44%	3.1	15	2	1.2
Rosa acicularis	SM	88%	7.6	30	1	2.6
Virburnum edule	SM	55%	6.7	20	5	1.9
Ribes triste	SM	22%	0.8	5	2	0.4
Rubus idaeus	SM	11%	1.7	15	15	0.4
Ledum palustrus	SM	55%	5.3	20	3	1.7
Spiraea beauverdiana	SM	22%	0.3	2	1	0.3
Vaccinium uliginosum	SM	11%	0.2	2	2	0.2
Menziesia ferruginea	SM	11%	3.9	35	35	0.7
Vaccinium vitis-idaea	SD	77%	5.8	15	T	2.1
Empetrum nigrum	SD	33%	0.8	5	T	0.5
Calamagrostis canadensis	G	66%	26.7	85	T	4.2
Carex spp.	G	22%	0.2	1	1	0.2
Equisetum pratense	F	22%	T	T	T	T
Equisetum arvense	F	22%	0.7	5	1	0.4
Cornus canadensis	F	100%	46.7	75	15	6.8
Dryopteris dilitata	F	22%	0.6	5	T	0.3
Epilobium angustifolium	F	88%	0.9	2	T	0.9
Linnaea borealis	F	77%	2.1	5	T	1.3
Galium boreale	F	22%	T	T	T	T
Heracleum lanatum	F	22%	T	T	T	T
Pyrola grandiflora	F	33%	0.7	5	1	0.5
Pyrola secunda	F	22%	T	T	T	T
Delphinium glaucum	F	11%	0.1	1	1	0.1
Aconitum Delphinifolium	F	11%	0.1	1	1	0.1
Geranium erianthum	F	44%	0.2	1	T	0.3
Mertensia paniculata	F	22%	0.4	2	2	0.3
Gymnocarpium dryopteris	F	11%	T	T	T	T
Lycopodium annotinum	F	77%	3.4	15	T	1.6
Lycopodium complanatum	F	11%	0.2	2	2	0.2
Moss	M	100%	30.6	60	5	5.5
Lichen	L	11%	1.1	10	10	0.3
Litter	B	100%	43.9	80	25	6.6
Woody Litter	B	22%	1.7	10	5	0.6

Paper Birch Woodland

***Betula papyrifera* woodland**

BEPA

Description

Paper Birch woodland consists of sparse to open stands of *Betula papyrifera*. *Picea glauca* is common in the overstory of many stands and is often well represented in the secondary tree layer. Tree canopy cover ranges from 12 to 40 percent. Paper Birch woodland includes mature stands of trees that may reach 50 or 60 feet in height. Stands include not only large trees but also small and advanced regeneration trees.

Salix spp. and *Alnus* spp. dominate the shrub secondary layer; cover ranges from 5 to 40 percent. The medium shrub layer varies from 15 to 30 percent cover. Important medium shrubs include *Ledum palustre* and *viburnum edule*.

Herb canopy cover ranges from 4 to 22 percent and includes a variety of low forbs. Important herbs, grasses and low growing shrubs include *Vaccinium vitis-idea, Cornus canadensis and Calamagrostis canadensis*. Leaf litter and mulch cover much of the soil surface in most stands (Figure 23).

Setting

Paper Birch woodland is found south of the runway along Little Campbell Creek.

Riparian-Wetland Status

Classification: Wetland Category A, usually upland; occasionally Palustrine broad-leaved deciduous scrub-shrub, saturated (*Cowardin et al. 1979*). This class falls within the AWMP wetlands boundary.

Figure 23. Open broadleaf forest of Paper Birch with a dense Bluejoint understory.

Paper Birch Woodland

Species Summary

Number of Stands = 4

Table 12.

			Cover			
Scientific Name	**Stratum**	**Con**	**Avg**	**Max**	**Min**	**Imp**
Betula papyrifera	TT	100%	10.5	15	5	3.2
Picea glauca	TT	100%	8.7	15	5	2.9
Populus tremuloides	TT	25%	1.2	5	5	0.6
Picea glauca	TM	50%	7.5	15	15	1.9
Betula papyrifera	TR	25%	0.2	1	1	0.2
Picea glauca	TR	25%	2.5	5	5	0.8
Alnus crispa	ST	50%	7.5	15	15	1.9
Rosa acicularis	SM	75%	12.5	15	5	3.1
Salix planifolia	SM	25%	0.25	1	1	0.2
Viburnum edule	SM	100%	5.8	15	1	2.4
Ribes trist	SM	50%	0.25	1	1	0.3
Rubus ideas	SM	75%	9.2	20	10	2.6
Vaccinium vitis-idaea	SD	25%	1.2	5	5	0.6
Calamagrostis canadensis	G	100%	72.5	85	55	8.5
Equisetum spp.	F	25%	1.2	5	5	0.6
Equisetum pratense	F	25%	1.2	5	5	0.6
Dryoteris dilitata	F	50%	T	T	T	T
Mertensia paniculata	F	75%	1.2	3	T	0.9
Cornus canadensis	F	100%	12.5	20	10	3.5
Galium boreale	F	25%	T	T	T	T
Pyrola secunda	F	25%	T	T	T	T
Gymnocarpium dryopteris	F	25%	T	T	T	T
Delphinium glaucum	F	50%	0.7	2	1	0.6
Heracleum lanatum	F	50%	0.5	2	T	0.5
Linnaea borealis	F	25%	T	T	T	T
Geranium erianthum	F	25%	T	T	T	T
Lycopodium annotinum	F	25%	0.2	5	5	0.6
Moss	M	100%	11.3	15	5	3.4
Litter	B	100%	70	75	65	8.4
Woody Litter	B	25%	3.7	15	15	0.9

Spruce/moss Forest

Picea spp./moss.

PICEA/moss

Description

Spruce/moss forest consists of open to moderately open stands of *Picea glauca* and *Picea mariana*. Where both species occur, the tallest trees are typically *Picea glauca* while *Picea mariana* is mixed with the *Picea glauca* in lower tree layers. In some stands *Picea mariana* is dominant in all tree layers. Tree canopy ranges from about 40 to 80 percent.

The understory is characterized by a sparse to open, tall shrub layer dominated by *Salix* spp. Medium and lower shrubs form a sparse to open secondary layer as well. This secondary layer includes *Ledum palustre, Cornus canadensis* and *Calamagrostis canadensis*.

The herb layer is dominated by moss, which covers up to 90 percent of the strata. Shallow permafrost soils are characteristic of these sites (Figure 24).

Setting

Spruce/Moss Forest is found throughout the Campbell Tract and adjoining Far North Bicentennial Park. Meadow areas that act as drains are associated with these sites.

Riparian-Wetland Status

Classification: Wetland Category A, Palustrine needle-leafed evergreen forest (*Cowardin et al. 1979*). A large proportion of this class falls within the AWMP wetlands boundary.

Figure 24. Closed needleleaf forest of Black Spruce with a thick moss understory.

Spruce Moss Forest

Species Summary

Number of Stands= 18

Table 13.

			Cover			
Scientific Name	Stratum	Con	Avg	Max	Min	Imp
Picea mariana	TT	39%	16.9	55	35	2.6
Betula papyrifera	TT	33%	2.1	10	3	0.8
Picea glauca	TT	22%	6.9	50	35	1.2
Picea mariana	TM	44%	16.7	50	T	2.7
Picea glauca	TM	6%	1.66	30	30	0.3
Picea mariana	TR	39%	2.22	15	T	0.9
Betula papyrifera	TR	11%	T	T	T	T
Alnus crispa	SM	11%	1.11	15	5	0.3
Rosa acicularis	SM	11%	0.05	1	T	0.1
Virburnum edule	SM	5%	0.05	1	1	0.1
Ribes triste	SM	22%	1.22	10	T	0.5
Salix planifolia	SM	39%	2	15	T	0.9
Salix spp.	SM	11%	0.17	3	T	0.1
Ledum palustrus	SM	89%	10.3	25	T	3.0
Spiraea beauverdiana	SM	50%	1.27	10	T	0.8
Vaccinium uliginosum	SM	33%	1	7	T	0.6
Chamaedaphne calyculata	SM	28%	0.55	7	T	0.4
Betula glandulosa	SM	39%	0.72	7	T	0.5
Vaccinium vitis-idaea	SD	89%	6.61	20	T	2.4
Empetrum nigrum	SD	61%	3	20	T	1.4
Calamagrostis canadensis	G	28%	8.6	90	5	1.6
Carex spp.	G	17%	0.33	5	T	0.2
Oxycoccus microcarpus	F	5%	T	T	T	T
Equisetum pratense	F	22%	0.5	5	2	0.3
Equisetum arvense	F	22%	0.89	15	T	0.4
Equisetum silvaticum	F	17%	2.5	20	T	0.7
Cornus canadensis	F	67%	8.61	60	T	2.4
Geocaulon lividum	F	33%	0.22	3	T	0.3
Epilobium angustifolium	F	22%	0.06	1	T	0.1
Linnaea borealis	F	33%	1.27	5	T	0.6
Pyrola secunda	F	17%	0.33	5	T	0.2
Potentilla palustris	F	5%	T	T	T	T
Mertensia paniculata	F	5%	T	T	T	T
Lycopodium annotinum	F	17%	0.94	7	5	0.4
Lycopodium complanatum	F	11%	0.22	4	T	0.2
Moss	M	100%	72.8	90	5	8.5
Lichen	L	72%	7.83	35	T	2.4
Litter	B	100%	10.8	25	5	3.3
Woody Litter	B	17%	1.11	10	5	0.4
Water	W	17%	0.94	10	2	0.4

Sweet Gale/Bluejoint Bog

***Myrica gale/Calamagrostis canadensis* Bog**

MYGA/CACA

Description

This low shrub meadow consists of a moderately open stand of *Myrica gale* with an understory made up of *Andromeda polifolia, Carex aquatilis* and *Carex* spp. *Calamagrostis canadensis* was found bordering the outer edge of the vegetation site. The site was observed on numerous occasions and was always inundated with water to some degree (Figure 25).

Setting

Only one site exists and is found along the south side of the trail that enters from the trailhead off Abbot Loop Road near 78th street.

Riparian-Wetland Status

Classification: Wetland Category A, Palustrine scrub-shrub, seasonally flooded (*Cowardin et al. 1979*). This class falls within the AWMP wetland boundary.

Figure 25. Open low shrub sweetgale-graminoid bog of *Myrica gale* and *Carex spp.* (foreground).

Sweet Gale/Bluejoint Bog

Species Summary

Number of Stands = 1

Table 14.

			Cover			
Scientific Name	**Stratum**	**Con**	**Avg**	**Min**	**Max**	**Imp**
Betula papyrifera	TR	100%	T	T	T	T
Myrica gale	SL	100%	40	40	40	6.3
Andromeda polifolia	SD	100%	10	10	10	3.2
Calamagrostis canadensis	G	100%	15	15	15	3.9
Carex aquatilis	G	100%	25	25	25	5
Carex spp.	G	100%	30	30	30	5.5
Potentila palustris	F	100%	T	T	T	T
Viola spp.	F	100%	T	T	T	T
Moss	M	100%	30	30	30	5.5
Water	W	100%	30	30	30	5.5
Litter	B	100%	20	20	20	4.5

White Spruce/Paper Birch Forest

Picea glauca/Picea mariana/Betula papyrifera Forest

PIGL/PIMA/BEPA

Description

The Mixed forest consists of open to moderately open stands of *Picea glauca, Picea mariana* and *Betula papyrifera*. Tree canopy cover ranges from 20 to 65 percent and tree size within the stands is almost entirely made up of tall trees. *Populus tremuloides* never dominates the deciduous portions of the stands but is consistently present.

A sparse and open tall shrub layer of *Salix* spp. and *Alnus crispa* characterizes the understory. Medium and lower shrubs dominate this site and cover from 5 to 45 percent of this layer. Species include *Ledum palustre, Vaccinium vitis-idea, Cornus canadensis* and *Calamagrostis canadensis*. Moss, lichens and litter dominated the herb layer. *Lycopodium annotinum* is also consistently present in dense patches at these sites (Figure 26).

Setting

White spruce/ paper birch forest is the largest vegetation type and found through out Campbell Tract.

Riparian-Wetland Status

Classification: Upland,
A majority of this class falls outside the AWMP wetland boundary.

Figure 26. Open mixed forest of White Spruce and Paper Birch.

White Spruce/Paper Birch Forest

Species Summary

Number of Stands = 21

Table 15.

Scientific Name	Stratum	Cover Con	Avg	Max	Min	Imp
Picea glauca	TT	62%	11.2	25	5	2.6
Picea mariana	TT	24%	3.3	30	7	0.9
Betula papyrifera	TT	90%	9.8	20	5	3.0
Populus tremuloides	TT	19%	1.4	15	5	0.5
Picea glauca	TM	28%	6.0	30	20	1.3
Picea mariana	TM	9%	2.6	25	10	0.5
Betula papyrifera	TM	9%	1.2	15	10	0.3
Populus tremuloides	TM	5%	0.2	5	5	0.1
Betula papyrifera	TR	38%	0.6	10	2	0.5
Picea glauca	TR	38%	2.5	15	2	1.0
Picea mariana	TR	24%	1.1	10	T	0.5
Populus balsamifera	TR	5%	0.2	5	5	0.1
Populus tremuloides	TR	5%	T	T	T	T
Alnus crispa	ST	9%	0.9	15	4	0.3
Alnus crispa	SM	5%	0.7	15	15	0.2
Rosa acicularis	SM	81%	6.3	15	T	2.3
Virburnum edule	SM	38%	2.5	20	T	1.0
Ribes triste	SM	24%	1.1	20	T	0.5
Rubus idaeus	SM	5%	T	T	T	T
Ledum palustrus	SM	71%	10.9	40	2	2.8
Salix planifolia	SM	52%	2.6	20	T	1.2
Spiraea beauverdiana	SM	9%	T	T	T	T
Vaccinium uliginosum	SM	33%	0.5	5	1	0.4
Vaccinium vitis-idaea	SD	90%	11.2	30	3	3.2
Empetrum nigrum	SD	38%	3.3	35	T	1.1
Calamagrostis canadensis	G	48%	5.6	30	T	1.6
Poa spp.	G	5%	T	T	T	T
Carex spp.	G	62%	0.3	2	T	0.5
Equisetum pratense	F	19%	T	T	T	T
Cornus canadensis	F	95%	25.2	55	5	4.9
Dryopteris dilitata	F	9%	T	T	T	T
Epilobium angustifolium	F	81%	1.5	5	T	1.1
Linnaea borealis	F	86%	7.2	25	1	2.5
Galium boreale	F	5%	0.1	1	T	0.1
Geocaulon lividum	F	33%	T	T	T	T
Pyrola grandiflora	F	29%	0.4	3	1	0.4
Pyrola secunda	F	33%	1.1	15	T	0.6
Achillea borealis	F	5%	T	T	T	T
Potentilla gracilis	F	5%	T	T	T	T
Mertensia paniculata	F	14%	0.1	2	T	0.1
Gymnocarpium dryopteris	F	5%	0.1	1	T	0.1
Lycopodium annotinum	F	71%	3.7	10	T	1.6
Lycopodium complanatum	F	29%	0.4	3	T	0.4
Moss	M	100%	65.0	85	20	8.1
Lichen	L	38%	4.0	20	5	1.2
Litter	B	100%	22.6	70	5	4.8
Woody Litter	B	43%	1.9	5	T	0.9
Soil	B	5%	0.2	5	5	0.1

White Spruce Woodland

***Picea glauca* Woodland**

PIGL

Description

White Spruce Woodland consists of *Picea glauca* in the medium tree or regeneration phase. Total spruce tree cover is 25 percent. Regenerating *Betula papyrifera, Populus balsamifera, Salix planifolia, Viburnum edule* and *Rosa acicularis* make up the 3 to 5 foot shrub strata. Moss and lichen cover most of the soil surface (Figure 27).

Setting

There are only two sites at Campbell Tract that fall within this vegetation category. One of these woodlands is the result of a disturbance (plane crash and fire) that occurred in 1972.

Riparian-Wetland Status

Classification: Upland,
The class falls outside the AWMP wetland boundary.

Figure 27. Open needleleaf woodland of *Picea glauca* with *Populus balsamifera* scrub.

Species Summary

Number of Stands = 2

Table 16.

Scientific Name	Stratum	Con	Cover Avg	Min	Max	Imp
Picea glauca	TM	100%	15	15	15	3.9
Betula papyrifera	TM	50%	2.5	0	5	1.1
Picea glauca	TR	100%	7.5	5	10	2.7
Betula papyrifera	TR	100%	22.5	5	40	4.7
Populus balsamifera	TR	100%	5	5	5	2.2
Populus tremuloides	TR	50%	T	T	T	T
Rosa acicularis	SM	50%	7	7	7	1.9
Salix planifolia	SM	100%	7.5	5	10	2.7
Viburnum edule	SM	50%	3	3	3	1.2
Ledum palustrus	SM	50%	2.5	5	5	1.1
Empetrum nigrum	SD	50%	2.5	5	5	1.1
Vaccimium vitis-idea	SD	100%	2.5	5	5	1.6
Calamagrostis canadensis	GM	50%	0.5	1	1	0.5
Agrostis scabra	GM	50%	0.5	1	1	0.5
Carex spp.	GL	50%	T	T	T	T
Epilobium angustifolium	FM	50%	T	T	T	T
Rhinanthus minor	FM	50%	T	T	T	T
Senecio spp.	FM	50%	T	T	T	T
Mertensia paniculata	FM	50%	2	2	2	1.0
Linnaea borealis	FD	50%	5	5	5	1.6
Taraxacum ceratophorum	FD	50%	T	T	T	T
Cornus canadensis	FD	100%	15	15	15	3.9
Moss	M1	100%	37.5	30	35	6.1
Lichen	L1	100%	5	T	10	2.2
Soil	B	100%	27.5	5	50	5.2
Litter	B	100%	32.5	20	45	5.7

Developed

Description

The developed area within Campbell Tract consists of the administrative offices of the Bureau of Land Management, Campbell Creek Science Center, gravel airstrip and taxi ways, helipads, and groomed and ungroomed trails (Figure 28). Although there may be some native vegetation within this site, the area as a whole, is paved or graveled and therefore does not fall into any vegetation class.

Setting

Developed roads and trails comprise approximately 78 acres and can be found throughout Campbell Tract (Figure 4).

Riparian-Wetland Status

Classification: Upland,
Developed area falls outside AWMP wetland boundary.

Figure 28. Developed area, Campbell Tract Facility.